United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.436/3
29 January 1985

ENGLISH

Expert Group Meeting on the Restructuring
of the Non-ferrous Metals Industries

Vienna, Austria, 18 - 21 March 1985

THE RESTRUCTURING PROCESS IN THE NON-FERROUS METALS INDUSTRIES AND THE POSSIBILITIES FOR FURTHER PROCESSING OF NON-FERROUS METALS IN DEVELOPING COUNTRIES

Discussion paper *

Prepared by the

UNIDO secretariat

* This document has been reproduced without formal editing.

V.85-21674

Foreword

The aim of this short paper is to synthesize the most relevant aspects of the topics developed in the two background papers prepared for this meeting. It should serve as an impulse for discussion of the present situation and future development of the non-ferrous metals industries, particularly from the perspective of the developing countries.

This discussion should center around the following main aspects:

(a) an anlysis of the new patterns of development of the non-ferrous metals industries and the strategies of the main actors, within the context of the global restructuring process that is taking place in the world economy;

(b) identification of the possibilities, advantages and constraints for a further processing of non-ferrous minerals in the developing countries that would lead to a more integrated and self-reliant developme..t;

(c) identification of key issues that could be discussed at the first consultation on the non-ferrous metals industries.

1. Introduction

During the late 1970s and early 1980s important changes took place in the non-ferrous metals industries. This turning point was due to the global restructuring process in the world economy, resulting from the crisis of the 1970s and the consequent reactions of the main actors trying to overcome it and to search for new patterns of growth.

The world restructuring process has modified the economic situation and bargaining position of many developing country non-ferrous metals producers, bringing them to a re-evaluation of their undertakings in the mineral raw materials sector.

It is in the context of the new world economic situation that different medium- and long-term patterns of development in the non-ferrous metals industries are emerging. It is of crucial importance to determine the essential aspects of these new patterns, and within them the strategies of the main actors, in order to establish the possibilities, advantages, and barriers for increased processing of non-ferrous minerals in the developing countries.

Increased processing of minerals has become a key element in developing countries proposals for a New International Economic Order. The primary reasons that developing country governments have advocated increased local mineral processing include: industrialization strategies based on a more integrated development; limitation of transnational corporations' ability to engage in transfer pricing; creation of opportunities for the training of nationals and the development of skills which can be used in other sectors of the economy; capture of a greater share of the economic rent from mineral production; and the hope of obtaining access to capital which might not otherwise be available.

2. Evolution of the non-ferrous metals industries in the 1970s and early 1980s.

The development of the non-ferrous metals industries has been influenced in this period by global economic stagnation, basic changes in the patterns of demand for non-ferrous metals, and modifications in the production structure of these industries.

The non-ferrous metals industries are very sensitive to fluctuations in the global economy because of the role of non-ferrous metals as intermediate products for the capital goods sector. The seven major OECD countries that are the main consumers of non-ferrous metals products experienced slow rates of growth of Gross National Product (GNP) in the late 1970s and decreases in GNP in the early 1980s.

These low growth rates in the industrialized countries have also, as has been widely noted, had a strong impact in restricting the growth of export-oriented developing countries, by reducing demand for these nations' exports and by contributing to the now chronic over-supply situation for most non-ferrous metals, a situation that has resulted in metal prices which are currently at or near the lowest point, in real terms, that has been reached in the past 40 to 50 years. This is a clear expression of the limits and conflicts that a predominantly externally-oriented economic development creates in developing countries.

Major changes are occurring in the quantity and quality of the demand for non-ferrous metals products by the main users; this is affecting the level and structure of production in the non-ferrous metals industries. There has been a significant decrease in the growth of the capital goods sector, the main consumer of non-ferrous metals products, over the past few years, as well as changes in its structure caused by the appearance of new technological processes and advances in manufacturing technique tending to reduce the weight of non-ferrous metals used in the fabrication of machinery and equipment. Furthermore, the steel industry, a major user of non-ferrous metals, has remained generally depressed, despite its recovery in some areas. Non-ferrous metals are also being replaced by alternative materials such as plastics and glass fibres.

The situation in the non-ferrous metals industries can also be attributed to a great extent to changes in the supply structure, due particularly to the increases in energy prices. As the non-ferrous metals industry is one of the most energy-intensive industrial sectors, the increase in energy prices is generating technological changes, plant closures, and the redeployment of production capacities toward energy-rich countries.

The world-wide rate of growth of consumption of non-ferrous metals in the period 1970-1983 was very slow. Even for aluminium, the most buoyant of the metals, the 1970-83 consumption growth rate was only 3 per cent per annum, while copper, nickel and zinc showed growth rates between 1 per cent and 2 per cent, and tin consumption a negative growth rate of 0.6 per cent. For more details see Table 1 (page 16).

In general, changes in production followed the evolution of consumption; however, the need of the developing countries for foreign currency caused them to increase production at a faster rate than consumption grew, which increased stocks, especially in the early 1980s, after their reduction following the recession of 1974-75. Non-ferrous metal prices, after recovering from the effects of the 1974-75 recession, rose, generally reaching their peak in 1979, but falling in the early 1980s. For more details see Table 2 (page 17).

3. The structure of the non-ferrous metals industries

The main characteristics of the structure of the non-ferrous metals industries, in the context of the global restructuring process in the world economy, are the following:

a) The structure of the non-ferrous metals mining and processing industries depends to a great extent on the growth and logic of development of the capital goods sector. Metals such as aluminium and nickel, because of their characteristics (light weight, etc.), are more linked with the present pace-setter capital goods industries, while the heavier metals are linked with the more traditional capital goods industries and with other sectors of the economy.

b) The developed market economies, which are the main producers of capital goods, are the major consumers of non-ferrous metals, mainly aluminium and nickel. These countries are also the major processors of the minerals, although they are not the main mining producers.

In 1980 the developed market economies consumed approximately 68.2 per cent of the world's primary aluminium 67.9 per cent of refined tin, 60.6 per cent of refined lead, and 57.1 per cent of slab zinc.

The developed market economies account for a major share of global output of processed metals, more than 50 per cent for all metals except tin. Their percentage share in processed output of all metals is much higher than their contribution to global mining output. In 1980, the developed market economies accounted for 68 per cent of world production of primary aluminium, 61.6 per cent of the production of refined lead, 60.7 per cent of slab zinc, 57 per cent of smelter-refined nickel, 50 per cent of refined copper, and 14.5 per cent of refined tin.

The developed market economies are major mining producers of zinc, lead and nickel. In 1980, they produced 51.5 per cent of the world mining output of zinc, 46.5 per cent of lead and 39.8 per cent of nickel. They produced a smaller share of bauxite (36.9%), copper (30.3%), and tin (7.1%).

c) The developing countries only participate to a small extent in world consumption and processing of non-ferrous metals, despite their major share in mining production. The development of their non-ferrous metals industries is externally oriented, which is reflected in the high share of exports in their total production of non-ferrous metals.

The developing countries have a relatively low share of world metals consumption, due to the relatively low development of the sectors that are the main users of processed non-ferrous metals, primarily the capital goods sector. In 1980, the shares of the developing countries were 13.4 per cent of the consumption of slab zinc, 5.7 per cent of refined nickel, 11.3 per cent of refined lead, 8.9 per cent of refined copper and 9.2 per cent of primary aluminium.

The participation of developing countries in industrial production is insignificant compared to their contribution to mining output, as a result of the low level of integration that these countries have between their mining activities and the different industrial processing operations. Tin is the only metal in which the developing countries have a high participation in processing output. In 1980 the developing countries accounted for 70.7 per cent of the world production of refined tin, a share similar to their contribution to mining output. For copper, their share was 23.2 per cent, for smelter-refined nickel production 15.3 per cent, for refined lead 13.5 per cent, for slab zinc 12.2 per cent, and for primary aluminium 10.7 per cent.

Developing countries are the major producers of mining output in tin, bauxite and copper. In 1980 they produced 76.8 per cent of the world mining output of tin, 50.5 per cent of bauxite and 43.9 per cent of copper. In nickel they produced 34.6 per cent, in lead 24.3 per cent and in zinc 22.7 per cent.

The share of exports in production of the processed metals under study is in general terms higher in the developing countries than in the developed market and centrally planned economies, reflecting the more outward-oriented development of the metal industries in developing countries. The share of exports of these countries in total production varies from 89.2 per cent in tin to 35.6 per cent in lead. By comparison, in the developed market economies the share varies from 75.1 per cent in nickel to 18.6 per cent in copper, and the ratio of exports to production in the centrally planned economies is very low, ranging from 15.6 per cent for nickel to 2 per cent for lead.

d) The centrally planned economies have a low participation in world trade, compared with the other groups of countries, because their production is mainly oriented to satisfy their domestic demand.

The centrally planned economies have a low share in both exports and imports of processed metals. Their contribution to world exports varies from 10.7 per cent in the case of nickel to 1.9 per cent in tin. With respect to imports, their share does not exceed 15 per cent of the world's imports of any of the different metals. They import 9.5 per cent of lead, 14.3 per cent of zinc, 4.2 per cent of copper, and 5.1 per cent of aluminium.

The centrally planned economies had similar shares in the world production of processed metals output to those in mining. The only exception is aluminium, where their share in processed output is much higher than in production of bauxite. The participation of these countries in world processing output of the different metals is approximately 20 per cent, with the exception of tin, which is only 7.8 per cent.

In 1980 centrally planned economies consumed 24.3 per cent of slab zinc, 23.8 per cent of refined nickel, 22.9 per cent of refined lead, 20.1 per cent of refined copper, 18.1 per cent of refined tin and 17.7 per cent of primary aluminium.

e) The non-ferrous metals industries have a high level of concentration. In the cases of aluminium and nickel, where concentration is very high, production is concentrated mainly in the hands of the TNCs. In the other metals there is a greater participation of developing country state enterprises (copper, tin) and of small and medium-sized enterprises (zinc, lead).

In aluminium, the six major TNCs accounted for approximately 57.8 per cent of the world market economy's bauxite production and the thirteen biggest enterprises accounted for 76.3 per cent. Among these enterprises are three state enterprises that produce approximately 9.3 per cent of world production. The six major transnational corporations accounted for 41.3 per cent of world market economy production of aluminium.

In nickel, eight companies account for 79 per cent of the world market economy mining capacity and 76.9 per cent of their processing capacity. The six major TNCs participate with 69.7 per cent of the mining and 68.8 per cent of the processing capacity, and the two major state enterprises from developing countries have 9.3 per cent of mining capacity and 8.1 per cent of processing.

In copper, 53.4 per cent of the developed market economy mining production is accounted for by twelve enterprises, Codelco (Chile) being the major company. This is a state enterprise that has approximately 11.5 per cent of the world market economy's mine capacity. The eight most important TNCs contribute 27.3 per cent of the world market economy's capacity and the

four most important state enterprises of the developing countries have 26.1 per cent. In processing output capacity, the 15 major enterprises hold 73 per cent of total smelter capacity in the market economies and 63 per cent of refinery capacity. The twelve major TNCs contribute 48.9 per cent of smelter capacity and 46.7 per cent of refinery capacity. The three major developing country state enterprises participate with 24.1 per cent of the smelter capacity and 16.3 per cent of the refinery capacity.

In tin, the three major mining enterprises are state companies. The major company is P.T. Timah (Indonesia) which produces 10 per cent of world mining output, the second is Comibol (Bolivia) with 9 per cent, and finally the Malaysia Mining Corporation Bhd. (MMC), with 8.5 per cent. In processing, eight companies have approximately 88.9 per cent of the world market economy's tin smelting capacity. Two major state enterprises of the developing countries participate with 17.1 per cent (P.T. Timah, Comibol), the major private company from the developing countries is from Malaysia, with 17.1 per cent, and the five major TNCs have 54.7 per cent.

In zinc, eleven major companies concentrate 45.2 per cent of world mining capacity in the market economies. Centromin, a Peruvian State enterprise that is among the eleven major companies, contributes 4.9 per cent of the world capacity. In zinc reduction, eleven major enterprises account for approximately 53.7 per cent of the world market capacity. In Europe, five corporate groups account for 80 per cent of all zinc reduction capacity, with state-owned firms in Finland, Yugoslavia, Italy, Austria and Spain making up the remainder. The major firm is Société Générale de Belgique which holds 40 per cent of European reduction capacity. The other major firms in the European industry include Rio Tinto Zinc, Metellgesellschaft, Preussag, and Imetal-Peussaroya.

In lead, no single firm or group has more than approximately 8 per cent of the total of the world market economy's primary lead refining capacity; however, the major thirteen account for 67.4 per cent of this capacity. The major developing country state enterprises are from Mexico (Penoles, Industria Minera Mexico) and account for approximately 10 per cent of the capacity of the world market economies.

4. Changes in the structure of the non-ferrous metals industries

The main changes in the structure of the non-ferrous metals industries in the 1970s were the following:

a) The developing countries generally increased their share in world mining output. The main increases were in copper and nickel, with increases of 4.9 per cent and 3.9 per cent respectively in the period between 1972 and 1980. In the case of tin there was a slight increase of 1.3 per cent in the share of the developing countries, in zinc and lead their contribution was practically without change, and in bauxite there was a decrease of 0.8 per cent.

The developed market economies decreased their share of mining output in all the minerals under study, with the exception of bauxite, where they had an increase of 4.4 per cent. There were considerable reductions in their shares in the mining production of nickel and copper - of 8.5 and 8.1 per cent respectively. Their decrease in mining production of zinc was by 3.7 per cent, of lead 3.1 per cent, and of tin 0.5 per cent.

The centrally planned economies increased their participation in almost all the minerals with the exception of bauxite, where they experienced a decrease of 4.6 per cent.

b) The developing countries increased their share in the consumption of processed metals in the period 1972-1980. These increases were, in general, higher than the percentage increment they experienced in the share of the world mining production, with the exceptions of copper and nickel, where the percentage increase was slightly lower.

The increases in the shares of the developing countries in world consumption were greatest in zinc, nickel and copper. In these three metals the increases were 4.6 per cent in zinc, and 3.4 per cent in the other two metals. In aluminium they increased their participation in world consumption by 2.8 per cent, in tin by 2.7 per cent, and in lead by 2.2 per cent.

Between 1972 and 1980, the developed market economies decreased their share in world consumption of all the metals under consideration. Their decrease in aluminium consumption was 5.2 per cent, which contrasts with their 4.4 per cent share increase in bauxite production. In zinc, tin and lead, the percentage decreases in their shares in consumption were greater that those for mining output. In zinc they decreased their share by 10.5 per cent, in tin by 7 per cent and in lead by 3.5 per cent. In nickel and in copper the decreases in their shares in consumption were less in percentage terms than they were in mining output. Their shares decreased by 3.8 per cent in nickel, and in copper by 7.5 per cent.

In the period 1972-1980, the centrally planned economies increased their share of world consumption of all metals with the exception of aluminium where their share remained the same. They increased their participation in consumption to a greater extent than in mining production for zinc, tin and lead. In zinc they increased their share by 5.1 per cent, in tin by 4 per cent, and in lead by 1.1 per cent. In nickel and in copper the percentage increases in their shares in consumption were relatively smaller than in mining output, being 1.7 and 2.1 per cent respectively.

c) In the 1970s the developing countries increased their participation in the production of the processed metals under study, with the exception of lead where they had a slight decrease. The increases in their share of processing output were higher than in their share of world consumption for aluminium, copper and tin, and smaller for the other metals. The increases were: 4.5 per cent for aluminium, 3.7 per cent for copper, and 8.7 per cent for tin. In the other metals, the increases were 2.7 per cent for nickel, 2.6 per cent for zinc, and a slight decrease of 0.1 per cent for lead.

The developed market economies decreased their share in the world processing output in the 1970s in all the metals, with the exception of lead, where they experienced a slight increase of 1 per cent. Their percentage decrease was greater in production than in consumption for copper (8%) and in tin (7.4%). For the other metals the decreases in the share of output processing were smaller: 4 per cent for aluminium, 3.7 per cent for nickel and 5.1 per cent for zinc.

The centrally planned economies had an increase in the share of the processing output in all the metals under study with the exception of aluminium and lead. Their increment in the share of industrial production was higher than the increase in their share in consumption only in the case of copper.

d) Between 1972 and 1982 the developing countries increased their share in world exports of all the metals, with the exception of lead where there was a slight decrease. Their share in world imports decreased for nickel and aluminium, remained the same for tin, and increased considerable for zinc and lead.

The developed market economies decreased their share in world exports, with the exception of lead and zinc, where they had an increase. These countries also experienced a decrease in their share of world imports, with the exception of tin, where they had a slight increase. The centrally planned economies decreased their share in world exports in all the metals with the exception of copper and nickel, and increased their share in the imports of all metals.

e) The concentration of the non-ferrous metals industries has decreased, lessening the importance of the oligopolistic barrier to entry into these industries for newcomers, which are mainly developing countries.

This decrease in the degree of concentration was due mainly to the reduction of the dominant role played in the 1950s by the enterprises of the United States and England, due to the increasingly important role played by enterprises from Japan and Europe and by national enterprises of developing countries.

f) The non-ferrous metals industries have experienced changes in their patterns of investment. Since approximately the end of the 1960s the major TNCs have decreased their direct investment in the developing countries.

The new patterns of investment that are taking place have created an apparent paradox in the pattern of mining and processing of non-ferrous metals, a paradox that lies in the decreasing direct investment in equity by the TNCs in the developing countries, and the increased participation of the developing countries in mining, consumption, processing and trade.

This apparent contrast can be explained by the increasing role of the governments in the developing countries, and initiatives taken by the TNCs for conversion from fully foreign-owned subsidiaries into joint ventures with national enterprises. This is also explained by the important substitution of loans for equity in the financing of non-ferrous metals projects in developing countries. In relation with this aspect, there was a reduction of private equity from 88 or 90 per cent of the total capital up to 1960, to about a third by the 1970s.

This spread of new patterns of investment arrangements has accelerated since the mid-1970s by the appearance of new sources of finance such as the transnational oil companies, governments of the oil-producing countries, insurance companies from western countries, and merchant finance and equipment-leasing schemes.

5. Projections for Non-ferrous Metals

With the exception of aluminium and, to a lesser extent nickel, the outlook for demand for the major non-ferrous metals is negatively affected by the substantial decline in intensity of use which has occurred since the oil price increase of 1973-74, and especially since the second major round of oil price increases in 1979-80. In the case of copper, for example, the use of optical fibers has substantially eroded the potential for growth in copper consumption in communications, one of the metal's major traditional markets. At the same time, copper use in the automotive industry has been substantially cut back by the use of plastics and other substitutes and by the development of metals-saving technologies, as, for example, in light-weight automobile radiators. Similarly, the use of zinc in automobiles has declined substantially, as weight-saving technologies are adopted in order to provide better fuel economy. And the traditional market for tinplate in beverage cans has been virtually eliminated by the substitution of aluminium, plastic and glass containers.

Despite substantial recovery in the demand for aluminium in 1983, most observers agree that the longer-term outlook for aluminium demand is for increases that more or less approximate world economic growth rates. Assuming continuation of recent OECD growth rates, an aluminium consumption growth of 3-4 per cent per annum appears to be a reasonable estimate.

The outlook for copper demand, at least in the 1980s, is universally agreed to be pessimistic. The 1970-83 growth rate of 1.7 per cent is a rough approximation of the current forecasts for consumption growth over the next decade (once again, assuming a continuation of recent OECD growth rates).

Nickel demand is largely derived from the demand for steel, and has been sharply affected by the depression in the steel industry, especially since 1980. For the longer term, few predictions of nickel demand foresee growth rates much in excess of the 1 per cent per annum level that has been achieved since 1970.

Although world-wide demand for lead was somewhat stronger than that for copper or nickel in the 1970-83 period, the longer term outlook appears to be more pessimistic. A growth rate somewhat less than the overall OECD economic growth rate seems a reasonable forecast for lead demand for the coming decade. Also, few industry analysts foresee demand for zinc rising faster than overall OECD economic growth.

Demand for tin has now been declining for many years; it appears that tin is a fully "mature" metal, and that the development of substantial new areas of use is extremely unlikely.

6. Prospects for further processing in developing countries

In view of the limited success developing countries have had with import-substitution strategies for industrialization and the limited number of countries that have been able to pursue successfully an export-oriented strategy for industrialization based on manufacturing or assembly operations, strategies of resource-based industrialization have been claiming increasing attention from developing-country planners. Two variations of such strategies have been tried. One, which could be called "primary export processing," is based on the assumption that more processing of, and, hence, more value-added from, primary product exports will speed the overall development of an economy. Success in pursuing such a strategy depends on the ability of the processed materials to compete in world markets, although it may be possible for a producer-country government to subsidize processing by making inputs, such as energy or infrastructure, available at lower than market prices.

The second strategy, which can be called "basic goods production," concentrates on the use of agricultural and natural-resource products not primarily for export, but rather for domestic consumption. This approach is in direct contrast to the typical post-colonial trade pattern in much of the Third World, where primary-product exports are used as a means of generating foreign exchange to pay for the import of intermediate and capital goods for import-substitution industries.

Many resource-rich developing countries have pursued a combination of the two strategies. Some developing countries with a relatively important industrial infrastructure have increased domestic processing of non-ferrous minerals, both for export and for use in domestic industries. Countries with a smaller domestic industrial base have vigorously pursued further processing as a means of adding value to exports, while countries with greater domestic opportunities, such as Mexico, have emphasized the basic goods production aspect of mineral processing. Many of the petroleum-producing countries have adopted ambitious industrialization plans based on export-oriented refining and the use of natural gas as a feedstock for petrochemical production.

In general, the governments of mineral-exporting developing countries are investigating the possibilities of increasing their economic diversification through a further processing of their non-ferrous minerals, motivated by the fact that an economic model based on unprocessed mineral exports may, in the long run, not provide an adequate basis for sustained and self-reliant development that can generate the desired expansion of GNP, employment, foreign currency earnings and public revenue. The process of diversification can strengthen the links in the industrial sector because local processing of one product makes possible primary production of another one, and can indirectly stimulate the production in the capital goods industry and other sectors of the economy that are the main users of semi-processed and processed non-ferrous metals products.

Through further processing, the developing countries can increase their national value-added and in some cases can also sell to a wider range of potential customers than can a producer of unprocessed or semi-processed minerals. This is due to the fact that most markets where unprocessed minerals are bought are highly concentrated, in contrast with refined metals and components that are bought by a variety of industries, where the concentration among buyers is often less.

Another reason that can lead a developing country to pursue downstream processing is that this may increase its flexibility in obtaining financial resources for the implementation of its projects. However, the bargaining position of the developing countries will depend on the level of international concern over raw material supplies.

In planning an integrated approach for developing their non-ferrous industries, the developing countries must take into account the barriers or obstacles to the development of further processing.

Developing countries have to face the problem of marketing metals, because the markets in some metals are highly concentrated and selling them requires a reasonably extensive marketing organization. These factors can prevent a developing country, even though it has a cost advantage, from achieving market entry.

Another obstacle is the lack of internal technological knowledge which can prevent an integrated development of the non-ferrous metals industries. Furthermore, there are new technological developments, such as continuous casting in the copper industry, that have the effect of making it more difficult for producers located at a considerable distance from the main markets to compete effectively. The lack of an adequate infrastructure in many developing countries is another barrier which leads to increased capital requirements and higher costs of new production facilities.

7. Final considerations

This Expert Group Meeting, considering the limited success of the industrialization process in many developing countries to date, the current process of world-wide industrial restructuring, and the severe financial constraints to the process of accumulation facing the developing countries, should try to identify the possibilities of further processing of minerals and the logic of development that the non-ferrous metals industries must follow in order to achieve a more self-reliant and integrated development. On the basis of this, the meeting should then identify key issues to be discussed at the first consultation on the non-ferrous metals industries.

Table 1

WORLDWIDE CONSUMPTION OF NON-FERROUS METALS

(thousand tonnes)

	1970	1975	1980	1983[1/]	1970-83 Growth Rate (%)
Aluminium	9996	11350	15312	14666	3.0%
Copper	7271	7458	9385	9050	1.7%
Tin	227	219	223	210	-0.6%
Nickel	577	576	717	672	1.1%
Zinc	5056	5066	6131	6308	1.7%
Lead	3871	4526	5348	5263	2.4%

1/ Estimated.

Sources: World Metal Statistics; Mining Annual Review 1984.

Table 2

Prices of Non-ferrous Metals[1/]

	Aluminium		Copper		Tin		Nickel		Zinc		Lead	
	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[3/] Cents per lb.	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[5/] Cents per lb.	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[3/] Cents per lb.	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[5/] Cents per lb.	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[3/] Cents per lb.	London Metal Exchange Cash settlements[2/] £ per metric tonne	US Producer Price[5/] Cents per lb.
1971	N/Q	29.00	444.43	51.43	1437.97	167.35	N/Q	1.33	127.11	16.13	103.93	13.82
1972	N/Q	26.41	427.96	50.62	1506.59	177.47	N/Q	1.40	151.04	17.75	120.73	15.03
1973	N/Q	25.00	726.82	58.85	1962.19	227.56	N/Q	1.53	345.46	20.66	174.58	16.29
1974	N/Q	34.13	877.00	78.77	3498.60	397.27	N/Q	1.74	528.38	35.95	252.88	22.53
1975	N/Q	39.79	566.81	63.25	3092.45	339.82	N/Q	2.07	335.66	38.95	185.63	21.53
1976	N/Q	44.34	782.40	68.98	4256.74	349.24	N/Q	2.26	394.95	37.01	250.70	23.10
1977	N/Q	51.34	750.25	66.21	6185.15	499.38	N/Q	2.28	338.12	34.39	354.11	30.76
1978	N/Q	53.08	710.50	65.81	6710.30	587.03	N/Q	2.08	309.14	30.97	342.79	33.65
1979	756.31	59.40	934.08	92.21	7281.37	713.05	N/Q	2.72	349.86	37.39	567.66	56.64
1980	766.63	69.57	941.75	101.31	7227.21	768.49	2809.57	3.42	327.42	37.43	391.29	42.45
1981	623.51	76.00	865.55	84.21	7088.74	648.40	2951.19	3.43	425.05	44.56	363.37	36.53
1982	567.00	76.00	846.14	72.80	7305.51	586.86	2750.91	3.20	425.47	38.47	310.72	25.54
1983	952.67	77.67	1048.84	77.86	8572.77	601.28	3088.86	3.20	505.82	41.39	279.97	21.68

Source: World Metal Statistics.

1/ Average prices.
2/ Primary ingots, minimum 99.5% purity.
3/ US producer last price as quoted by "Metals Week".
4/ High grade cathodes, prior to 1 December 1981, Wirebars.
5/ US producer cathodes as quoted by "Metals Week", prior to 1973, Wirebars.
6/ Refined tin, 99.7% minimum purity.
7/ New York Dealer Price as quoted in "Metals Week".
8/ Refined Nickel, melting grade.
9/ Producer cathodes as quoted by "Metals Week".
10/ G.O.B. Zinc, 98% minimum purity
11/ High Grade Zinc as quoted by "Metals Week", prior to September 1980 Prime Western delivered.
12/ Refined Pig Lead minimum 99.97% purity.
13/ New York as quoted by "Metals Week".